SUPPORT FOR THE AMENDMENT

Support for the above amendment is found throughout the specification, more specifically at pages 6-7 and the original claims. No new matter is believed to be introduced by the amendment.

REMARKS

At the outset, Applicants thank Examiner Di Grazio for the helpful comments during the courteous discussion of the present application held on November 21, 2002. Further, Applicants thank the Examiner for indicating that the amendment above, combined with the remarks below, would further favorable prosecution of the present application.

The Examiner has objected to Figure 5 for not containing units of time and pressure. Applicants respectfully submit herewith a proposed correction to Figure 5 indicating in red the appropriate units of time and pressure. Accordingly, withdrawal of this ground of objection is respectfully requested.

The Office has objected to Claims 1, 5, 7, 9, and 10 for various informalities. Applicants have amended the claims above in order to address all the Examiner's concerns, as well as provide amendments in accordance with her suggestions. Accordingly, withdrawal of this ground of objections is respectfully requested.

Claims 1-4 are rejected under 35 U.S.C. § 103(a) over Miyazaki et al. Miyazaki et al discloses, at best the broad description of the distribution density of spacers (projections) of from 0.00002 to 0.005 mm^2. However, Miyazaki et al fails to provide a single example wherein the distribution density of the spacers are in the range of 0.001 to 0.003, much less motivation to one reading its disclosure to provide such a display.

In direct contrast, Claims 1-7 relate to a liquid crystal display having an area

occupying ratio of the projection with respect to a region enclosed by the sealing material of from 0.001 to 0.03. Further, the specification provides Example 3 wherein the claimed display contains the claimed area occupying ratio of 0.0048 falling outside the claimed ratio and within the range of ratios broadly disclosed by Miyazaki et al. It is clear from Example 3 at page 19 of the specification that the display device containing an area occupying ratio falling within the broad disclosure of Miyazaki et al but outside the claimed range in the present specification does not offer good display characteristics. In fact, lines 25-28, at page 19, of the present specification specifically discloses that, through visual inspection of the panel (similar to that disclosed by Miyazaki et al), some display blurs were observed during the high temperature test.

In light of the above, Miyazaki et al clearly provide merely a broad disclosure of the area occupying ratio and fails to provide sufficient specificity towards the claimed range of ratios. Further, the present specification clearly demonstrates that a liquid crystal display device having a ratio that falls within the claimed range (see Example 2, at page 19, of the specification) is superior to that broadly disclosed by Miyazaki et al. Therefore, Miyazaki et al clearly fails to disclose and/or suggest the claimed invention. Accordingly, withdrawal of this ground of rejection is respectfully requested.

Claims 5-6 are rejected under 35 U.S.C. § 103(a) over Murouchi. The above amendment is believed to obviate this rejection because Claims 5-6 depend from Claim 1 which specify that the area occupying ratio is from 0.001 to 0.003. Although Murouchi discloses, at best, spacers of varying height, Murouchi clearly fails to disclose and/or suggest that the spacers may vary in height and that the area occupying ratio of the projections with respect to a region enclosed by the sealing material is from 0.001 to 0.003. Accordingly, withdrawal of this ground of rejection is respectfully requested.

The rejection of Claims 7-10 under 35 U.S.C. § 103(a) over Kajita et al and/or Miyake et al et al is believed to be obviated by the above amendment.

At best, Kajita et al discloses that a pressure of about 10,000 to 100,000 Pa may be applied to substrate. However, Kajita et al fails to provide a single example in which a substrate is subjected to a compression force of from 10,000 to 100,000 Pa, much less guidance to one reading its disclosure towards specific ranges therein. Therefore, Kajita et al merely provides a broad disclosure of possible compression forces that may be applied to substrates when making a product and lacks sufficient specificity to guide one reading its disclosure towards a specific range of possible compression forces.

Miyake et al et al discloses, at best, the dispersion of uncured sealing material at an injection port into the liquid crystal can be prevented by the application of UV light or radiation onto the injection port. However, Miyake et al et al fails to provide any guidance whatsoever with respect to a compression force that may be used to make a product by applying it to certain substrates. Accordingly, Miyake et al et al fails to provide any sufficient specificity toward a specific range of compression forces, much less a compression force at all, to one reading its disclosure.

In direct contrast, the method claims herein relate, in part, to applying a compression force that falls within a specific range of from 20,000 Pa to 40,000 Pa. Further, the Examiner's attention is directed to Examples 6 and 7, at page 21, of the specification, which provides a comparison between a panel made by the claimed process where a compression force is applied at 20,000 Pa (see Example 6) versus a panel which is made by applying a force that falls outside the claimed range of compression forces, such as 49,000 Pa (see Example 7). Example 6, which is a panel that was made by the claimed process, was found to contain neither blurs nor bubbles. In direct contrast, Example 7 relates to a panel that has

been made by a process which falls within the range of Kajita et al, but does not fall within the claimed range of compression forces. The panel of Example 7 is clearly less superior than a panel made by the claimed process (e.g., Example 6) because bubbles were observed during a low temperature test in this panel, but not the panel made by the claimed process (Example 6).

In light of the above, it is clear that Kajita et al and Miyake et al et al clearly fail to disclose and/or suggest, with sufficient specificity, a method of making a panel by applying compression forces that fall within the claimed range. Further, the present specification clearly demonstrates that panels made by the claimed processes are superior to those that are broadly disclosed by Kajita et al and/or Miyake et al et al. Accordingly, withdrawal of these grounds of rejection is respectfully requested.

The Examiner's attention is directed to new Claims 11-24 where more specific embodiments are claimed than those of Claims 1-10. More specifically, new Claim 12 is supported at Example 6 and new Claim 13 is supported by Example 9. New Claims 14-17 relate, in part, to a liquid crystal device of a transferred field method. It should be noted that this specific embodiment is clearly supported at page 2, lines 20-25, of the specification. Further, these claims specify an area occupying ratio similar to that of amended Claim 1 above. Since Kajita et al refers to an in-plate switching mode (IPS) system, which may be construed as the same as a transferred field method, Kajita et al clearly does not describe the control of a gap (distance between substrates) of a liquid crystal device. Further, in light of the arguments above, Kajita et al clearly fails to provide sufficient specificity for one to appreciate the superior qualities of a liquid crystal display containing the claimed area occupying ratio. Accordingly, Kajita et al fails to disclose or suggest the invention related to Claims 11-17.

Claims 18-24 are new claims which are further discussed by the claimed invention. More specifically, Claims 18-24 relate to a method for manufacturing a liquid crystal display device of a transversed field method. All of the above arguments also apply to new Claims 18-24. Accordingly, none of the cited references disclose and/or suggest Claims 17-24.

Applicants respectfully submit that the present application is now in condition for allowance. Should anything further be required to place this application in condition for allowance, the Examiner is requested to contact Applicants attorney by telephone.

Respectfully submitted,

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Marked-Up Copy
Serial No: 09/803,103
Amendment Filed on: HEREWITH

IN THE CLAIMS

1. (Amended) A liquid crystal display device comprising: a sealing material provided on a periphery of a substrate for preventing leakage of liquid crystal, projections formed by etching a film formed on the substrate, and another substrate opposing the substrate being remote therefrom by a gap and being supported by the projections, wherein an area occupying [rate] ratio of the projections with respect to a region enclosed by the sealing material is not less than [0.0001] 0.001 and not more than 0.003.

5. (Amended) [A] The liquid crystal display device of Claim 1, wherein heights of projections [comprising a sealing material provided on a periphery of a substrate for preventing leakage of liquid crystal, projections formed by etching a film formed on the substrate, and another substrate opposing the substrate being remote therefrom by a gap and being supported by the projections, wherein heights of columnar spacers] are varied.

7. (Amended) [A method for manufacturing] The liquid crystal display device of Claim 5, wherein the heights are different by not less than 0.05 μm and not more than 0.2 μm [comprising the steps of forming projections by etching a film formed on a substrate, applying a sealing material on a periphery of the substrate in an annular form expect for an

injection inlet for liquid crystal, overlapping another substrate onto the substrate with the projections and the sealing material being interposed therebetween, injecting liquid crystal through the liquid crystal injection inlet into a region enclosed by the sealing material, and applying a pressure of not less than 1,000 Pa and not more than 40,000 Pa to surfaces of both substrates].

8. (Amended) [The method of claim 7, wherein a pressure of not less than 1,000 Pa and not more than 20,000 Pa is applied onto the surfaces of the substrates] A method for manufacturing liquid crystal display device comprising: forming projections by etching a film formed on a substrate; applying a sealing material on a periphery of the substrate in an annular form expect for an injection inlet for liquid crystal; overlapping another substrate onto the substrate with the projections and the sealing material being interposed therebetween; injecting liquid crystal though the liquid crystal injection inlet into a region enclosed by the sealing material; and applying a pressure of not less than 20,000 Pa and not more than 40,000 Pa to surfaces of both substrates.

9. (Amended) The method of [any one of claims 7 to] claim 8, wherein a sealing agent is applied to the liquid crystal injection inlet simultaneously with applying pressure to the surfaces of both substrates.

10. (Amended) A method for manufacturing a liquid crystal display device comprising [the steps of]: forming projections by etching a film formed on a substrate[,]; applying a sealing material on a periphery of the substrate in an annular form [expect] except for an injection inlet for liquid crystal[,]; overlapping another substrate onto the substrate with

the projections and the sealing material being interposed therebetween[,]; injecting liquid crystal through the liquid crystal injection inlet into a region enclosed by the [seal agent,] sealing material; and applying a sealing agent to the injection inlet of the liquid crystal display device after elapse of a specified time from completion of injecting liquid crystal.

11-24. (New).

FIG. 5